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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/689,599

10/13/2000

Kwang Seop Park

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07/12/2004

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EXAMINER

AKKAPEDDI, PRASAD R

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 07/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/689,599

Applicant(s)

PARK ET AL.

Examiner

Prasad R Akkapeddi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 15-60 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13,15-23,33-42 and 44-60 is/are allowed.
- 6) ☒ Claim(s) 1-12 and 25-31 is/are rejected.
- 7) ☒ Claim(s) 24,32 and 43 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 October 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>06/06/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/25/2004 has been entered.

Claim Objections

2. Claim1 is objected to because of the following informalities: On line 9, there is no continuation after 'the organic insulating film'. It seems to be hanging in mid air. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. The terms "optimal and minimal" in claim 1 is a relative term which renders the claim indefinite. The terms "optimal and minimal" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The terms 'optimal and minimal' are indefinite, unless a specific value or

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range is provided such that one of ordinary skill in the art would be able to follow the disclosed method.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-12, 25-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gu et al. (Gu) (U.S. Patent No. 6,359,672) in view of Shimada et al. (Shimada) (U.S. Patent No. 6,147,722).

a. As to claim 1: Gu discloses a method of fabricating a liquid crystal display device including a thin film transistor (9) gate line (17) and data line (5) on a transparent substrate, forming the organic insulating film (33) on the transparent substrate to a thickness of between 0.9 to 2.75 micrometers (Col. 8, lines 21). This range of thickness overlaps the recited feature in the instant claim. Gu also discloses that the pixel electrode (3) (Col. 5, line 46) and the organic insulating film (33) so as to be overlapped by a predetermined area (Fig. 1) with the gate line (Col. 8, lines 49-51).

Gu also discloses that the organic insulating film (33) is over the address (data) lines (5) (col. 8, lines 14-15).

Also, for overlap of ranges, see MPEP 2131.03 for case law pertaining to

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rejections based on the anticipation of ranges. Note that the range for the thickness of the organic insulating film of between 0.9 to 2.75 micrometers as disclosed by Gu overlaps the range of 0.8 and 1.5 microns (as asserted in claim 1). Therefore, the range in claim 1 would have at least been obvious. See In re Malagari, 499 F.2d 197, 182 USPQ 549 (CCPA 1974).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the Gu LCD device with the thickness of between 0.8 and 1.5 microns for reducing the potential voltage swings.

Gu however, does not teach that the overlapped areas prevent light leakage and having minimal overlapping areas.

Shimada in disclosing a liquid crystal display discloses that the overlap widths are generally determined in consideration of the processing operation of the gate signal lines and the source signal lines which serves as light-shading films (col. 2, lines 14-22) (Figs. 30A and 3A). Shimada also teaches various widths for these overlapped areas (col. 12, lines 49-52).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to treat the overlapped areas as areas to prevent light leakage as taught by Shimada to achieve excellent display characteristics and high aperture ratio devices (col. 1, lines 10-12 and col. 2, lines 46-50).

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b. As to claims 7 and 25 (new): Gu discloses a liquid crystal display device (Fig. 1) containing a thin film transistor (9) gate line (17) and data line (5) on a transparent substrate, forming the organic insulating film (33) on the transparent substrate to a thickness of between 0.9 to 2.75 micrometers (Col. 8, lines 21). This range of thickness overlaps the recited feature in the instant claim. Gu also discloses that the pixel electrode (3) (Col. 5, line 46) and the organic insulating film (33) so as to be overlapped by a predetermined area (Fig. 1) with the data line (Col. 8, lines 14-15 and lines 49-51), and the source electrode (15) is connected to the pixel electrode (3) (Col.6, lines 32-33). Gu does disclose that the organic insulating film (33) is over the address (data) lines (5) (col. 8, lines 14-15).

Also, for overlap of ranges, see MPEP 2131.03 for case law pertaining to rejections based on the anticipation of ranges. Note that the range for the thickness of the organic insulating film between 0.9 to 2.75 microns as disclosed by Gu, overlaps the range of 0.8 and 1.5 microns as asserted in claim 7.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the Gu LCD device with the thickness of the organic insulating film between 0.8 and 1.5 microns for reducing potential voltage swings (abstract).

Gu teaches that parasitic capacitance is created at overlapped areas (col. 2, lines 7-21) and also teaches the relationship between the parasitic capacitance and the thickness of the layer, dielectric constant and the area of the

overlap (col. 5, lines 45-61). However, Gu does not teach that the parasitic capacitance in an overlapping area between the pixel electrode and the data line is different from a parasitic capacitance in an overlapping area between the pixel electrode and the gate line. The overlapped areas as taught by Gu are similar and hence the parasitic capacitance is the same between the areas of overlap of the pixel electrode with either the data line or the gate line.

Shimada on the other hand, discloses different overlapped widths of the pixel electrodes with the gate and data lines (Fig. 3A) and (col. 12, lines 1-52). Hence, if one takes into consideration the different widths for the overlapped areas as taught by Shimada and calculates the parasitic capacitance from the equation of Gu (col. 5, line 55), one can easily get that the parasitic capacitance in an overlapping area between the pixel electrode and the data line is different from a parasitic capacitance in an overlapping area between the pixel electrode and the gate line.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have different parasitic capacitances at the overlapped areas as taught by Shimada to achieve excellent display characteristics and high aperture ratio devices (col. 1, lines 10-12 and col. 2, lines 46-50).

c. As to claims 2-6: Gu discloses that the thickness of the organic insulating film is 0.9 micrometers which is less than 1.3 micrometers, and the dielectric constant is about 2.7 (Col. 7, line 37), which is less than 3.0, and the organic

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insulating film is made from Benzocyclobutene (BCB) (Col. 7, line 26). Gu also discloses that the line-pixel capacitance (also parasitic capacitance Cpl, Col. 5, line 52) value in areas of overlap is less than 9.0 fF (Col. 9, lines 1- 5), and the width of an overlapping area at which the pixel electrode is overlapped with the data line (5) is between 2-3 micrometers (Col. 8, lines 52-53) which is greater than 1.5 micrometers as recited.

d. As to claims 8-12 and 26-31 (new): Gu also discloses that the dielectric constant is about 2.7 (Col. 7, line 37), which is less than 3.0, and the organic insulating film is made from Benzocyclobutene (BCB) (Col. 7, line 26), the thickness being 0.9 micrometers which is less than 1.3 micrometers. Gu also discloses that the line-pixel capacitance (also parasitic capacitance Cpl, Col. 5, line 52) value in areas of overlap is less than 9.0 fF (Col. 9, lines 1- 5). Also, for overlap of ranges, see MPEP 2131.03 for case law pertaining to rejections based on the anticipation of ranges. Note that the range for the parasitic capacitance value as disclosed by Gu overlaps the range of less than 0.0003pF (asserted in claims 12). Therefore, the range in claims 12 would have at least been obvious. See In re Malagari, 499 F.2d 197, 182 USPQ 549 (CCPA 1974).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the Gu LCD device with the parasitic capacitance value of less than 0.0003pF and adjusting thickness of the organic insulating film between 1.25 and 1.27 microns (as asserted in claim

11), for reducing the capacitive crosstalk and permit the insulating means to be photoimaged (col. 4, lines 27-29).

Allowable Subject Matter

7. Claims 24, 32 and 43 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The allowable subject matter being: "the thickness and the dielectric constant of the organic insulating film are selected such that a liquid crystal pixel cell driven with the pixel electrode charges to a voltage which is more than 95% of a video data voltage within $\frac{1}{2}$ of an enabling interval of a control signal that is applied to a gate electrode for defining a channel of the thin film transistor."

8. Claims 13, 15-23, 33-42 and 44-60 are allowed.

The allowable subject matter being: "the thickness and the dielectric constant of the organic insulating film are selected such that a liquid crystal pixel cell driven with the pixel electrode charges to a voltage which is more than 95% of a video data voltage within $\frac{1}{2}$ of an enabling interval of a control signal that is applied to a gate electrode for defining a channel of the thin film transistor."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prasad R Akkapeddi whose telephone number is 571-272-2285. The examiner can normally be reached on 7:00AM to 5:30PM M-Th.

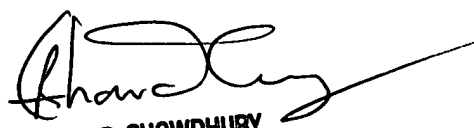
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PRA

Prasad R Akkapeddi, Ph.D
Examiner
Art Unit 2871


TARIFUR R. CHOWDHURY
PRIMARY EXAMINER